**Postdoctoral Researcher in Systems Viral Immunology**

Department of Virology, Immunology & Microbiology, Boston University Chobanian & Avedisian School of Medicine

Atomic Lab (<https://atomic-lab.org/>) at the National Emerging Infectious Diseases Laboratories, 620 Albany Street, Boston, MA 02118

**Job description**

Atomic Lab at Boston University is looking for a highly motivated Postdoctoral Researcher to join our team specializing in infectious disease prevention and personalized vaccine strategies. Our lab's work centers on studying the mechanisms of immune memory cells and exploiting emerging technologies such as high throughput ‘omics’ assays and AI algorithms to understand the immune system’s response to (re)emerging viruses with pandemic potential.

The successful candidate will spearhead a project focused on the subsets of memory CD8+ T cells, as a promising target for universal flu vaccine development. Ideally, the candidate must possess a prowess for high-dimensional cytometry (CyTOF and Aurora, Cytek), cell sorting, single-cell RNA sequencing, CITE-seq, ATAC-seq, and large-scale T cell-based assays. They will apply these approaches to design, perform, and analyze investigations that will shape our studies about vaccines inducing long-lived cellular immunity.

The candidate must have a firm grasp on the use of advanced in vitro and ex vivo infection models and immune organoids for mechanistic preclinical testing of vaccine candidates. The role requires a high degree of independence, particularly in conducting complex experiments and troubleshooting problems. Exceptional skills in data interpretation, record keeping, data and code management and an ability to meet deadlines are crucial. The selected candidate should be enthusiastic about generating and analyzing complex immunological data sets, developing new tools and methods, and nurturing less-experienced team members. The role will also require a proactive and adaptable approach to work, alongside a readiness to collaborate within our expansive network that includes the Center of Excellence for Influenza Research and Response and other renowned global institutions.

Lastly, the candidate should be prepared for significant contributions to presentation preparations (nationally and internationally), grant proposals, and manuscript writing, reflecting their crucial role in the Atomic Lab and the broader scientific community.

**Responsibilities:**

* Leading a project focusing on the systems-level understanding and manipulation of memory T cells for the potential development of effective vaccines. This will entail in-depth systems-level and single-cell analysis of these T-cell subsets along with mechanistic validations and preclinical testing of potential vaccine candidates.
* Independently perform intricate analyses and spearhead small-scale collaborative projects integral to our ongoing work. Your leadership will be paramount in determining the correlates of protection involved in current clinical studies on vaccination, infection research, and controlled human infection studies. Your ability to lead and deliver on these collaborative projects will significantly contribute to our research outcomes.
* Fostering original ideas by developing research questions related to the immunological signatures of protective immunity. This involves conducting individual research and analyzing complex data from clinical studies on vaccines and infections.
* Adapting existing and innovating novel methods: You will be responsible for adapting existing scientific techniques and developing innovative experimental protocols related to systems immunology. This includes staying up-to-date with advancements in the fields of systems immunology and vaccine development, and integrating these advancements into the ongoing project.
* Collaborating and leading: You'll work collaboratively within the team and external network, leading the development and establishment of appropriate analytical protocols to support research. This will also extend to collaborating on projects with external institutions and research groups. In addition, you are expected to set clear task objectives, organize and delegate tasks, provide mentorship to the team, and represent us at internal/external meetings/seminars.
* Preparing documentation, writing manuscripts, and obtaining funding: Your role includes meticulous record-keeping, accurate report preparation, and ensuring team members are updated about project progress and issues. You will routinely contribute to peer-reviewed journals and present research findings at conferences. Additionally, you will be involved in writing funding applications for new projects and securing research funds via grant applications.

**Selection criteria**

**Essential:**

* Hold a PhD in immunology, systems biology, or other closely related fields.
* Demonstrated track record of publishing original research in peer-reviewed scientific journals. This should include at least one first-author publication, evidencing the candidate's ability to conduct meaningful research and communicate findings effectively. Please provide a list of published works, highlighting any particularly impactful or relevant research in the field of immunology, virology, or a related area.
* Track record demonstrating that candidate has an adequate specialist knowledge to independently design, execute, analyze and present data from immunology experiments that involve in-depth immunological analysis and systems-level understanding of findings. Techniques where you will be proficient include high-dimensional cytometry using CyTOF and Aurora, cell sorting, single-cell sequencing, immune cell stimulation assays, and experience in mechanistic studies using in vitro and ex vivo models.
* Applicants are required to have experience in presenting research findings at scientific conferences. This includes oral presentations, whether as a keynote speaker, a session speaker, or a poster presentation with an oral component. Evidence of such presentations, including details of the conference name, date, and the topic presented, should be included in the application. Preference will be given to candidates who have presented at internationally recognized conferences in relevant scientific fields.
* Have specialist knowledge in infectious disease, vaccine development, and memory T cells that allows contribution of ideas for new research projects and research income generation.
* Acquisition of research funds through grant applications is desirable. Ability to independently plan, manage, and budget a research project, fellowship or smaller pump-priming awards and experience in contributing to grant research proposals.
* Excellent interpersonal skills with a capacity to work collaboratively, including the ability to communicate results clearly and effectively both orally and in writing.
* Experience in offering technical advice and intellectual support and mentorship to other researchers, including PhD students, research assistants, fellow postdoctoral scientists, and clinicians. Preference will be given to candidates who have provided mentorship.

**Desirable:**

• Experience in mechanistic studies using organoids.

• Proficiency in ATAC-seq and CITE-seq methodologies.

• Familiarity with the application of AI in immunology.

• Experience of submitting grant applications and supervising staff.

Please note, while animal work is not essential, experience in this area could be an additional asset.

The positions can be assumed immediately. Applicants should send their CV, a list of publications with highlighted intellectual and technical contributions to each listed publication, a supporting statement encompassing a cover letter and outline how you meet each selection criterion detailed in the job description, and three letters of recommendation to Prof. Dr. Adriana Tomic
at email: atomic@bu.edu